Invasive Phragmites: Discovering the Tipping Point

Sept. 8, 2017

http://naturechange.org/2017/09/08/invasive-phragmites-discovering-the-tipping-point/

It's late summer at Fisherman's Island State Park on Lake Michigan's coast, just south of Charlevoix, and a team of researchers in chest-high waders are shuffling out into the water and wetland plants to drive fence posts and pull samples of the sediment along the shore.

Phragmites (*phragmites australis*) is an invasive perennial marsh grass that can grow very, very quickly into extremely dense stands over 6-foot tall. This plant can spread by seeds, soil movement or extensive under and above ground stems that can reach many yards away. Phragmites crowds out everything else and can completely disrupt healthy fish and wildlife habitat.

Professor Deborah Goldberg leads the community ecology aspects of this interdisciplinary research. In this video, Goldberg explains how habitats invaded by phragmites can experience a tipping point. This aggressive and dominant plant can capture and concentrate nutrients running off the land. Ultimately, even small additions of nutrients can give phragmites the push it needs to completely overcome all the natural vegetation and establish a mono-culture. Once past that tipping point, it can be very, very difficult – if not impossible – to return to anything that looks like the original habitat.

Topics Covered

Ecology; Botany; Biology; Water Quality; Habitat; Math (exponential growth)

Next Generation Science Standards

- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.
- 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
- HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

- HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.